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Results of Double-Star Measures with the 8-inch Equatoreal at Windsor, N. S. Wales, in 1892. By John Tebbutt.

Ref. No.	Star.	Observed Magnitude.	Approx. Place of Star. R. A.	Approx. Place of Star. Dec. S.	Fraction of Year.	Position Angle.	No. of Obs.	Distance.	No. of Obs.	Mag. Power.	Hour-Angles.	Hour-Angles.	Weight, 1 to 5.
			h m	° ′		°		″			h m	h m	
1	*p* Eridani	...	1 36	56 45	·750	225·7	10	...	...	300	2 50 E	2 27 E	...
2	„	...	„	„	·925	...	...	7·01	6	170	1 28 E	1 17 E	4
3	„	...	„	„	·925	226·4	10	...	...	230	1 3 E	0 44 E	4
4	„	...	„	„	·928	226·9	10	...	...	300	1 30 E	1 11 E	4
5	*h* 4373	9, 9	10 44	41 0	·457	...	...	6·01	5	100	2 31 W	2 41 W	2
6	α Crucis	...	12 21	62 30	·482	120·0	10	4·92	6	...	2 17 E	1 47 E	3 & 2
7	„	...	„	„	·542	116·6	10	4·82	7	300	1 33 W	2 3 W	4
8	γ Centauri	...	12 36	48 22	·441	0·0	10	...	...	300	2 22 E	2 4 E	4
9	„	6, 6	„	„	·444	359·0	10	...	...	300	2 13 E	1 50 E	4
10	„	...	„	„	·446	...	...	1·46	10	170	2 47 E	2 26 E	4
11	„	...	„	„	·449	...	...	1·42	10	170	2 37 E	2 21 E	4
12	„	4, 4	„	„	·457	...	...	1·94	10	170	1 1 W	1 24 W	3
13	„	4, 4	„	„	·460	359·8	10	1·71	10	300	2 2 E	1 27 E	4
14	„	...	„	„	·482	357·3	10	1·69	10	300	1 47 E	1 10 E	5
15	„	...	„	„	·487	359·0	10	1·72	8	300	1 28 E	1 6 E	4
16	„	...	„	„	·597	358·0	10	1·82	7	535	2 0 W	2 29 W	4
17	„	...	„	„	·600	357·9	10	1·50	7	535	1 50 W	2 15 W	5
18	γ Virginis	...	12 56	0 51	·485	151·7	10	5·51	8	300	1 31 E	1 4 E	4

Ref. No.	Star.	Observed Magnitude.	Approx. Place of Star. R. A.	Approx. Place of Star. Dec. S.	Fraction of Year.	Position Angle.	No. of Obs.	Distance.	No. of Obs.	Mag. Power.	Hour-Angles.	Hour-Angles.	Weight, 1 to 5.
			h m	° ′		°		″			h m	h m	
19	γ Virginis	...	12 56	0 51	·545	152·9	10	5·61	8	300	0 19 W	0 46 W	4 & 3
20	β Muscæ	3½, 3½	12 40	67 31	·457	...	...	1·32	8	170	1 34 W	1 58 W	1
21	,,	...	,,	,,	·457	333·2	10	...	...	300	2 14 W	2 26 W	1
22	,,	...	,,	,,	·460	337·7	10	...	...	300	1 18 E	0 58 E	2
23	,,	...	,,	,,	·460	335·9	5	...	...	300	0 3 W	0 9 W	3
24	,,	...	,,	,,	·471	334·2	10	1·34	8	300	1 37 E	1 6 E	4
25	,,	...	,,	,,	·476	338·7	10	...	...	535	1 28 E	1 10 E	1
26	,,	...	,,	,,	·482	335·0	10	...	...	300	3 20 E	2 54 E	3
27	,,	...	,,	,,	·487	334·7	8	...	...	300	1 4 E	0 48 E	2
28	,,	...	,,	,,	·542	336·5	10	...	...	300	0 25 W	0 39 W	2
29	*h* 4634	8, 9	13 51	55 28	·441	19·9	10	...	...	140	1 19 E	1 0 E	...
30	,,	8, 9	,,	,,	·444	20·1	10	...	...	140	2 6 E	1 36 E	3
31	,,	8, 9	,,	,,	·446	...	...	12·64	7	110	1 28 E	0 24 E	3
32	,,	8, 9	,,	,,	·449	...	...	12·84	10	100	1 58 E	1 33 E	3
33	,,	8, 9	,,	,,	·471	19·4	10	12·11	7	140	1 7 E	0 33 E	3
34	α Centauri	...	14 32	60 23	·441	205·3	10	...	...	230	1 21 E	1 1 E	3
35	,,	1, 2	,,	,,	·444	206·1	10	...	...	300	2 0 E	1 46 E	2
36	,,	...	,,	,,	·446	...	...	19·80	10	170	4 12 E	3 54 E	3
37	,,	1, 2	,,	,,	·449	...	...	20·24	10	170	4 6 E	3 44 E	3
38	,,	...	,,	,,	·460	205·1	10	...	...	140	4 37 E	4 24 E	4

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Ref. No.	r.	Observed Magnitude.	Approx. Place of Star. R. A.	Approx. Place of Star. Dec. S.	Fraction of Year.	Position Angle.	No. of Obs.	Distance.	No. of Obs.	Mag. Power.	Hour-Angles.		Weight, 1 to 5.
			h m	° ′		°		″			h m	h m	
39	α Centauri	1, 2	14 32	60 23	·460	205·4	10	...	...	140	4 24 E	4 11 E	4
40	„	...	„	„	·463	205·3	10	19·67	10	300	3 52 E	3 20 E	3
41	„	...	„	„	·463	205·9	10	...	...	300	1 36 E	1 14 E	3
42	„	...	„	„	·471	205·4	10	19·30	7	300	0 39 E	0 11 E	3
43	„	...	„	„	·482	205·7	10	19·37	7	...	3 2 E	2 37 E	4
44	„	...	„	„	·485	205·5	10	19·58	6	300	0 47 E	0 21 E	4
45	„	...	„	„	·526	205·7	10	19·85	10	300	1 40 W	2 12 W	3
46	„	...	„	„	·597	206·0	10	...	...	535	1 41 W	2 0 W	4
47	„	...	„	„	·600	205·4	10	...	...	535	1 9 W	1 30 W	3
48	„	...	„	„	·613	206·0	10	...	...	535	0 30 W	0 49 W	2
49	„	...	„	„	·613	205·6	10	19·97	7	535	3 20 W	3 53 W	4
50	„	...	„	„	·753	206·7	10	19·89	10	300	1 38 W	2 13 W	3
51	π Lupi	5, 5	14 58	46 38	·441	86·5	10	...	...	300	1 10 E	0 48 E	2
52	„	5, 5	„	„	·444	86·9	10	...	...	300	1 59 E	1 43 E	4
53	„	5, 5	„	„	·446	...	...	1·34	6	170	1 16 E	1 6 E	3
54	„	5, 5	„	„	·449	...	...	1·41	8	170	2 15 E	1 56 E	3
55	„	...	„	„	·460	87·0	10	...	...	300	0 48 E	0 30 E	3
56	„	...	„	„	·753	88·1	10	1·48	5	300	3 52 W	4 15 W	3
57	„	...	„	„	·756	88·7	10	1·47	5	300	4 6 W	4 30 W	4
58	Lacaille, 6477	7, 7	15 38	65 6	·471	155·8	10	1·96	8	300	1 5 E	0 38 E	5
59	„	7, 7	„	„	·485	154·3	10	2·07	5	300	0 43 E	0 12 E	3

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			h m	° ′		°		″			h m	h m	
60	ρ Ophiuchi	...	16 19	23 12	·438	354·8	10	3·23	8	300	...	0 4 W	...
61	„	...	„	„	·463	354·7	10	3·39	8	300	2 7 E	1 36 E	4
62	36 Ophiuchi	...	17 9	26 26	·463	195·3	10	4·32	7	300	2 8 E	1 42 E	4 & 3
63	„	4, 4	„	„	·471	195·7	10	4·11	7	300	1 56 E	1 30 E	5
64	Brisbane, 6556	7, 7¼	18 54	37 13	·460	281·3	10	12·57	7	230	3 16 E	2 41 E	4
65	γ Cor. Aust.	...	18 59	37 13	·460	173·4	10	...	...	300	2 42 E	2 23 E	3
66	„	4, 4	„	„	·471	173·9	10	1·69	10	300	2 58 E	2 33 E	5
67	„	...	„	„	·753	170·5	10	1·61	10	300	1 53 W	2 44 W	5
68	„	...	„	„	·756	174·7	10	...	...	300	1 10 W	1 42 W	4
69	„	...	„	„	·756	172·2	10	...	...	300	2 57 W	3 22 W	5

Remarks.

The columns headed "Hour Angles" denote the hour angles between which the measures were made, and the last column the weight assigned to the observations from a consideration of the conditions under which they were made. 1 denotes the worst and 5 the best conditions possible.

Nos. 2, 3, 4, 5, 7, 8, 13, 14, 15, 16, 17, 18, 20, 21, 26, 29, 33, 34, 38, 39, 40, 41, 42, 43, 44, 45, 49, 61, 62, 63, 65, 66, 67, 69. The line joining the observer's eyes was parallel to that joining the components.

Nos. 6, 12, 19, 22, 23, 24, 27, 28, 46, 47, 48, 50, 51, 56, 57, 58, 59, 64, 68. These lines were at right angles.

Nos. 8, 9, 10. 11, 12, 13, 15, 18, 20, 51, 52, 53, 54, 58, 59, 63, 65. Components equal.

No. 5. The determination of the place of this star is uncertain.

No. 25. Observations of little value.

No. 26. The south component certainly the brighter.

No. 32. The clock acted badly.

Nos. 38, 39, 45, 50. Measures in sunlight.

Nos. 2, 4, 13, 28, 48, 56, 57. Measures in twilight.

Nos. 14, 40. Measures partly in sunlight and partly in twilight.

Windsor, N. S. Wales:
1893 *February* 11.

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On the Orbit of O Σ 285. By J. E. Gore.

Recent measures made by Mr. Burnham with the 36-inch refractor of the Lick Observatory, show that the angular change in this pair, since its discovery, amounted last year to 270°. I have computed the orbit and find the following provisional elements:—

Elements of OΣ 285.

$P = 118{\cdot}57$ years $\qquad ☊ = 106^\circ\ 58'$

$T = 1881{\cdot}93 \qquad \lambda = 161^\circ\ 24'$

$e = 0{\cdot}58 \qquad a = 0''{\cdot}46$

$i = 45^\circ\ 42' \qquad \mu = -3^\circ{\cdot}036$

The following is a comparison between the measures used in computing the orbit and the positions computed from the above elements. A correction of 180° has been applied to the measures marked with an asterisk, the components being nearly equal in brightness:—

Epoch.	Observer.	θ	θ_c	$\theta_o - \theta_c$	ρ_o	ρ_c	$\rho_o - \rho_c$
		°	°	°	″	″	″
1845·80	O. Struve	72·2	73·5	−1·3	0·61	0·56	+0·05
1847·96	Mädler	72·2	70·9	+1·3	0·42	0·53	−0·11
1852·69	”	60·6	64·2	−3·6	0·45	0·48	−0·03
1852·74	O. Struve	57·8	64·1	−6·3	0·50	0·48	+0·02
1855·84	”	53·9	58·8	−4·9	0·51	0·44	+0·07
1857·50	Secchi	65·5	55·6	+9·9	0·4	0·41	−0·01
1865·50	Dembowski	36·5	32·3	+4·2	oblong?	0·30	...
1881·50	Burnham		Round or doubtful			0·19	...
1883·84	Engelmann	*258·3	252·4	+5·9	0·22	0·17	+0·05
1885·40	Perrotin	*225·0	232·3	−7·3	oblong?	0·16	...
1887·56	Schiaparelli	202·2	204·3	−2·1	0·24	0·17	+0·07
1891·30	Burnham	168·7	169·0	−0·3	0·24	0·23	+0·01
1892·30	”	162·2	162·2	0·0	0·21	0·25	−0·04

Assuming that the mass of the system is equal to the mass of the Sun, the "hypothetical parallax" would be

$$p = \frac{a}{P^{\frac{2}{3}}} = 0''{\cdot}019.$$

The magnitudes of the components are about 7·0, 7·2; and the approximate position of the pair for 1880·0 is

R.A. $14^{\mathrm{h}}\ 41^{\mathrm{m}}$
Decl. $+42^\circ\ 53'$.